

Cross-Sectional Evidence for a Stress-Negative Affect Pathway to Substance Use among Sexual Minority Girls

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Abstract

Sexual minority girls (SMGs) are four times more likely to engage in substance use than are heterosexual girls. A better understanding of the explanatory mechanisms of this disparity is needed to inform prevention and intervention programs. The goal of this study was to conduct a preliminary test of a “stress-negative affect” pathway by examining gay-related victimization and depression as mediators of substance use among SMGs. Adolescent girls ($N = 156$, 41% SMGs) were recruited from two urban adolescent medicine clinics to participate in an NIH-funded study of adolescent substance use. The average age was 17.0 years old and 57% were nonwhite. Mediation analyses were conducted in a multiple regression framework using SPSS and a mediation macro utilizing bias-corrected bootstrapping. Four models were estimated to test mediated pathways from sexual orientation to gay-related victimization (Mediator 1), to depression symptoms (Mediator 2), and then to each of four substance use variables: cigarettes, marijuana, alcohol, and heavy alcohol use. Significant mediated pathways (mediation tests with 95% CIs) were found for cigarette, alcohol and heavy alcohol use outcome variables. Results provide preliminary support for the minority stress hypothesis and the stress-negative affect pathway, and may inform the development of future prevention and intervention programs. Clin Trans Sci 2013; Volume 6: 321–322

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Introduction

Sexual minority girls (SMGs; girls who report same-sex sexual orientation) are over 400% more likely to report substance use than are heterosexual girls.¹ The minority stress hypothesis² suggests that SMG disparities may be due to a pervasive homophobic culture that promotes discrimination and violence against members of the lesbian, gay, and bisexual (LGB) community, causing stress and long-term negative health consequences of stress. A recent meta-analysis showed that LGB youth do indeed suffer from higher rates of violence and victimization compared with heterosexual youth.³ Other recent cross-sectional studies have shown that stress mediated depression outcomes among LGB youth⁴ and importantly that gay-specific victimization acted as a mediator.⁵ The goal of the current cross-sectional study was to build upon these important findings by extending this mediated pathway to substance use outcomes, and determining whether the combination of gay-related victimization and depression symptoms explained substance use outcomes among SMGs, in what has become known as the stress-negative affect pathway of risk.⁶ Given that there are currently no empirically supported substance use interventions available for the LGB youth population, identifying mediated pathways of risk for substance use among this high-risk group is an important first step in future efforts to translate psychosocial health research findings into effective interventions.

Method

Participants

Participants were recruited from patients being seen by adolescent medicine specialists for routine or consultative medical care at two urban adolescent medicine clinics in Ohio and Pennsylvania. Inclusion criteria were: (1) age 14–19 years old and (2) ability to read and understand English at the sixth grade level. Neither the participants' health status at the time of their clinical visit nor their presenting problem were considered

as inclusion or exclusion criteria for recruitment. Participants were 156 adolescent females ranging in age from 14.1 to 19.7 ($m = 17.0$, $SD = 1.33$). Represented racial groups included 43% African-American, 44% White, 1% Asian-American. Twelve percent reported a multiracial heritage and 10% reported Hispanic heritage.

Procedure

Study procedures were approved by the Institutional Review Boards at the University of Pittsburgh and Nationwide Children's Hospital. Parental consent was obtained for all participants 14–17 years old. Participants completed mental health and psychosocial health questionnaires including substance use on a computer in a private room.

Measures

Sexual orientation

Participants' sexual orientation was measured by one item that stated “Please choose the description that best fits how you think about yourself.” Response options were: 100% heterosexual (straight); mostly heterosexual (straight), but somewhat attracted to people of your own sex; bisexual—that is, attracted to men and women equally; mostly homosexual (gay), but somewhat attracted to people of the opposite sex; and 100% homosexual (gay). Girls who indicated any category other than 100% heterosexual ($n = 64/156$, 41%) were considered SMGs.

Gay-related victimization experiences

Victimization was measured by four items that assessed the frequency during the past 6 months of being teased/bullied, hit/beaten up, treated unfairly, or called bad names because someone thought the participant was gay/lesbian. Responses were scored as 0 = never, 1 = once or twice, 2 = a few times, and 3 = many times (Cronbach's $\alpha = 0.86$).

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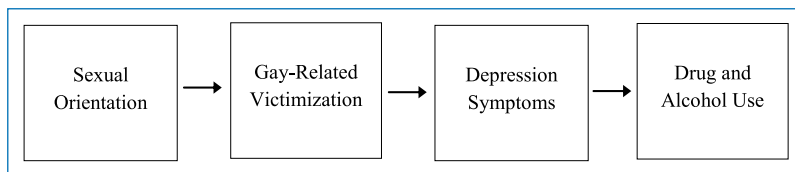


Figure 1. Gay-related victimization experiences and depression symptoms statistically mediate substance use disparities among sexual minority girls.

Depression symptoms

The CESD⁷ was administered to assess frequency of depression symptoms during the past week. A mean score of 20 common symptoms of depression scored on a scale of 0 (rarely or none of the time) to 3 (most or all of the time) was used.

Substance use

Frequency of cigarette, alcohol, heavy alcohol, and marijuana use in the past six months were measured. Response scale ranged from 0 (none) to 10 (several times a day).

Results

Sixty-seven percent of SMGs and 51% of heterosexual girls endorsed cigarette, alcohol, and/or marijuana use in the previous six months. Mediation was tested in a regression framework using the PROCESS macro for SPSS⁸ and followed recommended statistical methods.⁹ Participants' age and race were included as covariates. Mediated effects were calculated by multiplying the unstandardized beta coefficients that represented each of the paths (Figure 1). Mediated effects were tested for significance by estimating bias-corrected 95% confidence intervals utilizing bootstrapping. Four models were estimated to test the pathways from sexual orientation to gay-related victimization (Mediator 1), to depression symptoms (Mediator 2), to each of the outcome variables. With the exception of marijuana use, all of the individual path coefficients were significant: sexual orientation to victimization, $\beta = 0.21, p < 0.01$; victimization to depression symptoms, $\beta = 0.27, p < 0.01$; and depression symptoms to cigarette use $\beta = 1.16, p < 0.05$, frequency of alcohol use, $\beta = 0.64, p < 0.01$, and heavy alcohol use, $\beta = 0.61, p < 0.001$. Results showed that the serial mediation test was significant for cigarette use (CI: 0.01–0.26), alcohol use (CI: 0.01–0.13) and heavy alcohol use (CI: 0.01–0.13). The relationship between depression symptoms and marijuana use, and the associated mediation test, were not significant.

Discussion

To date there are no empirically supported substance use interventions that are tailored for the unique needs of the LGB youth population. In order to design successful interventions researchers must focus on changing the mediators of substance use. Doing so requires the translation of important empirical

results from the “other” basic sciences including epidemiology and psychology.¹⁰ Statistical mediation analysis can be used to test the fundamental tenets of explanatory frameworks such as the minority stress hypothesis² and the stress-negative affect pathway.⁶ Our results provide preliminary support for both of these models, showing that gay-related stress experiences and depression symptoms statistically mediated alcohol and cigarette use outcomes among SMGs. Of course mediator models are inherently causal models,⁹ thus the cross-sectional design of our study must be noted as a limitation. Future research with larger samples and longitudinal data are needed to conduct more rigorous mediation tests that can ensure the temporal ordering of variables and rule out other potential confounding effects. Although translating our results directly into the design of an intervention study would be premature, these results are an important first step in translating self-reported health and wellness data to inform the design and implementation of much needed substance use prevention and intervention programs for SMGs. In combination with the other mediation papers recently published,^{4,5} these results suggest that the reduction of gay-related stress experiences and associated depression symptoms may reduce substance use among SMGs.

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References

1. Marshal MP, Friedman MS, Stall R, King KM, Miles J, Gold MA, Bukstein OG, Morse JQ. Sexual orientation and adolescent substance use: a meta-analysis and methodological review. *Addiction*. 2008; 103: 546–556.
2. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull*. 2003; 129:674–697.
3. Friedman MS, Marshal MP, Guadamuz TE, Wei C, Wong C, Stall R. A meta-analysis to examine disparities in childhood physical and sexual abuse among sexual and non-sexual minorities. *Am J Public Health*. 2011; 101: 1481–1494.
4. Williams T, Connolly J, Pepler D, Craig W. Peer victimization, social support, and psychosocial adjustment of sexual minority adolescents. *J Youth Adol*. 2005; 34(5): 471–482.
5. Almeida J, Johnson RM, Corliss HL, Molnar BE, Azrael D. Emotional distress among LGBT youth: the influence of perceived discrimination based on sexual orientation. *J Youth Adol*. 2009; 38: 1001–1014.
6. Hussong AM, Jones DJ, Stein GL, Baucom DH, Boeding S. An internalizing pathway to alcohol use and disorder. *Psychol Addictive Behav*. 2011; 25: 390–404.
7. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Measurement*. 1977; 1: 385–401.
8. Hayes AF. 2012. PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>.
9. MacKinnon DP. *Introduction to Statistical Mediation Analysis*. 2008. New York, NY: LEA.
10. Woolf SH. The meaning of translational research and why it matters. *JAMA*. 2008; 299(2): 211–213.